

Job Risk Analysis																		
Name(s) of Risk Team Members: J. Scott, R. Karol				Point Value → Parameter ↓		1		2		3		4		5				
Job Title: MCR Watches, CAS Watch, Tandem Watch, Cryogenics Watch, Siemens Watch				Frequency (B)		≤once/year		≤once/month		≤once/week		≤once/shift		>once/shift				
Job Number or Job Identifier: JRA 13-04																		
Job Description: Routine and non-routine tours, inspection, alarm responses, of C-AD facility on a 24 hour shift rotation.				Severity (C)		First Aid Only		Medical Treatment		Lost Time		Partial Disability		Death or Permanent Disability				
Training and Procedures List (optional): C-A Access, RW-1, RW-300, Electrical (safety, LOTO, working hot), Confined Spaces, Hazard Communication, OJT equipment training, C-AD OPM				Likelihood (D)		Impossible		Unlikely		Possible		Probable		Multiple				
Approved by: <i>E. Lessard</i> Date: 11/22/04 Rev. #: 1																		
Stressors (if applicable, please list all): Unwilling helpers, heat, lighting, moisture, snow, extended work hours, working alone				Reason for Revision (if applicable): Use of specific snow and ice traction cleats for shoes during berm sweeps. Lessons learned from B929 RF amplifier fire in 11/04.						Comments:								
						Before Additional Controls								After Additional Controls				
Job Step / Task	Hazard	Control(s)	Stressors Y/N	# of People A	Frequency B	Severity C	Likelihood D	Risk* AxBxCxD	Control(s) Added to Reduce Risk	Stressors Y/N	# of People A	Frequency B	Severity C	Likelihood D	Risk* AxBxCxD	% Risk Reduction		
Sweeps in buildings	Ionizing radiation exposure	RWP, training, surveys, PPE, TLD, EPD, entry log sheets, procedures, postings, access control systems, chipmunks, RCT support	Y	2	3	1	2	12										

Sweeps in buildings	Electrical	LOTO, work planning, training, procedures, postings, guarding	Y	2	3	3	2	36	A new computer based LOTO program was introduced to better track LOTOs. C-AD supervisors removed temporarily stored items away from disconnects and breaker panels. Technicians, engineers and electricians were trained regarding the proper use of temporary wiring. Temporary wiring installations are now tracked and when due they are removed or converted to permanent wiring. OPM 13.6.2 was modified to state that an ECN is required prior to issuing a work order for all work on the power distribution system. A drawing or a sketch and a printed label or panel directory is now issued with the work order. Supervisors now indicate that all labeling was completed. Electricians have been assigned to label existing disconnects for a few hours each week.	Y	2	3	3	2	36	The likelihood of an injury has been reduced but it is not zero. Severity, frequency and # of people do not change.
Sweeps in buildings	Being struck by an object due to improperly secured material or loss of control of objects in magnetic fields	LOTO, training, procedures, postings, magnetic field measurements	Y	2	3	1	2	12								
Sweeps in buildings	Being struck by an object due to a pressure release in nearby pressurized systems	LOTO, work planning, procedures, postings, caution tags	Y	2	3	2	2	24								
Sweeps in buildings	Oxygen deficiency	Training, PPE, POMs, postings, PASS oxygen alarms, installed oxygen alarms, LOTO, work planning, procedures, evacuation training	Y	2	3	3	2	36	Work practice with a nitrogen purge flow was reviewed. The PASS was felt not be as reliable for nitrogen as it is for helium and it was decided that ASSRC would investigate this issue further.	Y	2	3	3	2	36	No change at this time
Sweeps in buildings	Noise	Training, procedures, PPE, postings	Y	2	3	2	2	24	<p>A new Subject Area for Noise and Hearing was developed in January 2004. Postings are improved. Work Planning now requires an appropriate hazard assessment of the operation (see the section Evaluating Noise Hazards) addressing the following:</p> <ul style="list-style-type: none"> • Potential engineering and administrative controls • Personal Protective Equipment (PPE) • Exposure monitoring • Medical surveillance 	Y	2	3	2	2	24	The likelihood of an injury has been reduced but it is not zero. Severity, frequency and # of people do not change.

Sweeps in buildings	Falls on same level due to poor walking surfaces	Maintenance of walking surfaces, lighting, proper shoes, work planning	Y	2	3	3	3	54	C-A staff was asked to identify outside walking/working surfaces that are in need of repair. PE instituted a program to correct deficiencies. Snow shovels and salt were distributed to staff for emergency use on walkways in winter storms. A safety checklist: Walking and Working Surfaces was distributed to staff. C-A O.P.M. 2.28.d was updated to indicate that work performed with risk factors of slipping and falling shall be classified at a minimum as a moderate hazard job and will require additional review and an Enhance Work Permit.	Y	2	3	3	2	36	33%
Sweeps in buildings	Falls to lower level such as falling from a ladder or over a railing	Training, railings, proper ladders, maintenance of surfaces, stairs, alternate methods of conducting sweeps, proper shoes	Y	2	3	3	3	54								
Sweeps outside	Ionizing radiation exposure	RWP, training, surveys, PPE, TLD, entry log sheets, procedures, postings, access control systems, chipmunks, RCT support, lighting	Y	2	3	1	2	12								
Sweeps outside	Electrical	LOTO, work planning, training, procedures, postings, guarding	Y	2	3	3	2	36	A new computer based LOTO program was introduced to better track LOTOs. C-AD supervisors removed temporarily stored items away from disconnects and breaker panels. Technicians, engineers and electricians were trained regarding the proper use of temporary wiring. Temporary wiring installations are now tracked and when due they are removed or converted to permanent wiring. OPM 13.6.2 was modified to state that an ECN is required prior to issuing a work order for all work on the power distribution system. A drawing or a sketch and a printed label or panel directory is now issued with the work order. Supervisors now indicate that all labeling was completed. Electricians have been assigned to label existing disconnects for a few hours each week.	Y	2	3	3	2	36	The likelihood of an injury has been reduced but it is not zero. Severity, frequency and # of people do not change.

Sweeps outside	Falls on same level due to poor walking surfaces	Maintenance of walking surfaces, lighting, proper shoes, work planning, procedures, snow shoveling, stay off steep slopes	Y	2	3	3	3	54	C-A staff was asked to identify outside walking/working surfaces that are in need of repair. PE instituted a program to correct deficiencies. Snow shovels and salt were distributed to staff for emergency use on walkways in winter storms. A safety checklist: Walking and Working Surfaces was distributed to staff. C-A O.P.M. 2.28.d was updated to indicate that work performed with risk factors of slipping and falling shall be classified at a minimum as a moderate hazard job and will require additional review and an Enhance Work Permit.	Y	2	3	3	2	36	33%
Sweeps outside	Falls to lower level such as falling from a ladder or over a railing or rolling down a shield berm	Training, railings, proper ladders, maintenance of surfaces, stairs, alternate methods of conducting sweeps, proper shoes	Y	2	3	4	3	72	C-AD is in the process of adding railings to caps to prevent slipping, making employees aware of this routine hazard, inspecting surfaces better during safety inspections, making WCCs include better evaluation of this hazard during work planning. CAS is purchasing snow and ice traction cleats for shoes.	Y	2	3	4	2	48	33%
Sweeps outside	Ticks, spiders, bees wasps, etc.	Training, procedures, PPE, bug sprays, post sweep body checks	Y	2	3	3	3	54								
Sweeps outside	Bushes, trees, etc.	Maintenance of area, awareness of hazards, PPE	Y	2	3	2	3	36								
Gate Watch	Ionizing radiation exposure	RWP, procedures, TLD	Y	1	2	1	2	4								
Facility tours	Ionizing radiation exposure	RWP, training, surveys, PPE, TLD, EPD, entry log sheets, procedures, postings, access control systems, chipmunks	Y	2	2	1	2	8								
Facility tours	Electrical	LOTO, work planning, training, procedures, postings, guarding	Y	2	4	3	2	48	A new computer based LOTO program was introduced to better track LOTOs. C-AD supervisors removed temporarily stored items away from disconnects and breaker panels. Technicians, engineers and electricians were trained regarding the proper use of temporary wiring. Temporary wiring installations are now tracked and when due they are removed or converted to permanent wiring. OPM 13.6.2 was modified to state that an ECN is required prior to issuing a work order for all work on the power distribution system. A drawing or a sketch and a printed label or panel directory is now issued with the work order. Supervisors now indicate that all labeling was completed. Electricians have been assigned to label existing disconnects for a few hours each week.	Y	2	4	3	2	48	The likelihood of an injury has been reduced but it is not zero. Severity, frequency and # of people do not change.

Facility tours	Being struck by an object due to improperly secured material or loss of control of objects in magnetic fields	LOTO, training, procedures, postings, magnetic field measurements	Y	2	4	1	2	16								
Facility tours	Being struck by an object due to a pressure release in nearby pressurized systems	LOTO, work planning, procedures, postings, caution tags	Y	2	4	2	2	32								
Facility tours	Oxygen deficiency	Training, PPE, POMs, postings, PASS oxygen alarms, installed oxygen alarms, LOTO, work planning, procedures, evacuation training	Y	2	4	3	2	48								
Facility tours	Noise	Training, procedures, PPE, postings	Y	2	4	2	2	32	A new Subject Area for Noise and Hearing was developed in January 2004. Postings are improved. Work Planning now requires an appropriate hazard assessment of the operation (see the section Evaluating Noise Hazards) addressing the following: • Potential engineering and administrative controls • Personal Protective Equipment (PPE) • Exposure monitoring • Medical surveillance	Y	2	4	2	2	32	The likelihood of an injury has been reduced but it is not zero. Severity, frequency and # of people do not change.
Facility tours	Falls on same level due to poor walking surfaces	Maintenance of walking surfaces, lighting, proper shoes, work planning, snow removal	Y	2	4	3	3	72	C-A staff was asked to identify outside walking/working surfaces that are in need of repair. PE instituted a program to correct deficiencies. Snow shovels and salt were distributed to staff for emergency use on walkways in winter storms. A safety checklist: Walking and Working Surfaces was distributed to staff. C-A O.P.M. 2.28.d was updated to indicate that work performed with risk factors of slipping and falling shall be classified at a minimum as a moderate hazard job and will require additional review and an Enhance Work Permit.	Y	2	4	3	2	48	33%
Facility tours	Falls to lower level such as falling from a ladder or over a railing or rolling down a shield berm	Training, railings, proper ladders, maintenance of surfaces, stairs, proper shoes	Y	2	3	3	2	36								

Facility tours	Flammable and combustible gases	Training, procedures, postings, work planning, gas concentration alarms	Y	2	4	2	2	32								
Facility tours	Biological hazards	Training, ventilation, PPE, cleanliness controls, ESRC reviews, normal and emergency procedures	Y	2	2	2	2	16								
Provide safety watch	Ionizing radiation exposure	RWP, training, surveys, PPE, TLD, EPD, entry log sheets, procedures, postings, access control systems, chipmunks, RCT support	Y	1	3	1	2	6								
Provide safety watch	Electrical	LOTO, work planning, training, procedures, postings, guarding, PPE, working hot permits, safe distance requirements, Fire/rescue group, emergency response	Y	1	3	3	3	27	A new computer based LOTO program was introduced to better track LOTOs. C-AD supervisors removed temporarily stored items away from disconnects and breaker panels. Technicians, engineers and electricians were trained regarding the proper use of temporary wiring. Temporary wiring installations are now tracked and when due they are removed or converted to permanent wiring. OPM 13.6.2 was modified to state that an ECN is required prior to issuing a work order for all work on the power distribution system. A drawing or a sketch and a printed label or panel directory is now issued with the work order. Supervisors now indicate that all labeling was completed. Electricians have been assigned to label existing disconnects for a few hours each week.	Y	1	3	3	2	24	11%
Provide safety watch	Being struck by an object due to improperly secured material or loss of control of objects in magnetic fields	LOTO, training, procedures, postings, magnetic field measurements	Y	1	2	1	2	4								
Provide safety watch	Being struck by an object due to a pressure release in nearby pressurized systems	LOTO, work planning, procedures, postings, caution tags, Fire/rescue group, emergency response	Y	1	3	3	2	18								
Provide safety watch	Oxygen deficiency	Training, PPE, POMs, postings, PASS oxygen alarms, installed oxygen alarms, LOTO, work planning, procedures, evacuation training	Y	1	3	3	2	18								

Provide safety watch	Noise	Training, procedures, PPE, postings	Y	1	3	2	2	12	<p>A new Subject Area for Noise and Hearing was developed in January 2004. Postings are improved. Work Planning now requires an appropriate hazard assessment of the operation (see the section Evaluating Noise Hazards) addressing the following:</p> <ul style="list-style-type: none"> • Potential engineering and administrative controls • Personal Protective Equipment (PPE) • Exposure monitoring • Medical surveillance 	Y	1	3	2	2	12	The likelihood of an injury has been reduced but it is not zero. Severity, frequency and # of people do not change.
Provide safety watch	Falls to lower level such as falling from a ladder or over a railing or rolling down a shield berm	Training, railings, proper ladders, maintenance of surfaces, stairs, proper shoes, Fire/rescue group, emergency response	Y	1	3	3	3	27								
Provide safety watch	Flammable and combustible gases	Training, procedures, MSDS, postings, work planning, gas concentration alarms, Fire/rescue group, emergency response, fire alarms	Y	1	2	2	2	8	A Fire Protection Engineer has been added to BNL staff and he has begun formal Fire Hazards Analyses for C-AD facilities.	Y	1	2	2	2	8	The likelihood of an injury has been reduced but it is not zero. Severity, frequency and # of people do not change.
Emergency response	Ionizing radiation exposure	RWP, training, surveys, PPE, TLD, EPD, entry log sheets, procedures, postings, access control systems, chipmunks, RCT support	Y	2	2	1	2	8								

Emergency response	Electrical	LOTO, work planning, training, procedures, postings, guarding	Y	2	2	4	2	32	A new computer based LOTO program was introduced to better track LOTOs. C-AD supervisors removed temporarily stored items away from disconnects and breaker panels. Technicians, engineers and electricians were trained regarding the proper use of temporary wiring. Temporary wiring installations are now tracked and when due they are removed or converted to permanent wiring. OPM 13.6.2 was modified to state that an ECN is required prior to issuing a work order for all work on the power distribution system. A drawing or a sketch and a printed label or panel directory is now issued with the work order. Supervisors now indicate that all labeling was completed. Electricians have been assigned to label existing disconnects for a few hours each week. C-AD is in the process of improving information available to CAS on the location of isolation breakers and crash buttons at key buildings to help in quick isolation of electrical supply to buildings.	Y	2	2	4	2	32	The likelihood of an injury has been reduced but it is not zero. Severity, frequency and # of people do not change.
Emergency response	Being struck by an object due to improperly secured material or loss of control of objects in magnetic fields	LOTO, training, procedures, postings, magnetic field measurements	Y	2	2	2	2	16								
Emergency response	Being struck by an object due to a pressure release in nearby pressurized systems	LOTO, work planning, procedures, postings, caution tags	Y	2	2	3	2	24								
Emergency response	Oxygen deficiency	Training, PPE, POMs, postings, PASS oxygen alarms, installed oxygen alarms, LOTO, work planning, procedures, Fire/rescue group, fire alarms, evacuation training	Y	2	2	4	2	32								

Emergency response	Noise	Training, procedures, PPE, postings	Y	2	2	2	2	16	<p>A new Subject Area for Noise and Hearing was developed in January 2004. Postings are improved. Work Planning now requires an appropriate hazard assessment of the operation (see the section Evaluating Noise Hazards) addressing the following:</p> <ul style="list-style-type: none"> • Potential engineering and administrative controls • Personal Protective Equipment (PPE) • Exposure monitoring • Medical surveillance 	Y	2	2	2	2	16	The likelihood of an injury has been reduced but it is not zero. Severity, frequency and # of people do not change.
Emergency response	Falls on same level due to poor walking surfaces	Maintenance of walking surfaces, lighting, proper shoes, work planning	Y	2	2	3	3	36	C-A staff was asked to identify outside walking/working surfaces that are in need of repair. PE instituted a program to correct deficiencies. Snow shovels and salt were distributed to staff for emergency use on walkways in winter storms. A safety checklist: Walking and Working Surfaces was distributed to staff. C-A O.P.M. 2.28.d was updated to indicate that work performed with risk factors of slipping and falling shall be classified at a minimum as a moderate hazard job and will require additional review and an Enhance Work Permit.	Y	2	2	3	2	24	25%
Emergency response	Falls to lower level such as falling from a ladder or over a railing or rolling down a shield berm	Training, railings, proper ladders, maintenance of surfaces, stairs, alternate methods of conducting sweeps, proper shoes	Y	2	2	3	3	36								
Emergency response	Flammable and combustible gases	Training, procedures, postings, MSDS, work planning, gas concentration alarms and interlocks, Fire/rescue response, fire alarms	Y	2	2	2	3	24								
Emergency response	Biological hazards	Training, ventilation, PPE, cleanliness controls, ESRC reviews, normal and emergency procedures, Fire/rescue response	Y	2	2	2	2	16								
Incidental snow shoveling	Overexertion – injuries caused by excessive lifting, pushing, pulling, holding, carrying or throwing of an object	Proper shoes, gloves, minimize amount of shoveling, PE grounds shoveling, procedures	Y	2	1	4	3	24	The OHSAS 18001 management system is expected to raise awareness with regards to sprains and strains during manual-lift or manual-pull work. Strains and sprains and first aid events are discussed at the quarterly WOSH Committee meetings. Each C-AD meeting now starts with “5-minutes” on safety and strain and sprain events are discussed.	Y	2	1	4	2	16	33%

Vehicle use	Vehicle accidents	Licensed drivers, traffic rules and postings, vehicle inspections and maintenance, snow shoveling	Y	2	5	3	2	60								
Incidental rigging	Being struck by an object due to improperly secured material or loss of control	Training, daily crane inspections prior to use, PE crane maintenance, PPE, certified rigging equipment, Tier 1, yearly rigging inspections, load weights and center of gravity known prior to lift, procedures, critical lift and engineered lift requirements and reviews, warning alarms, postings, work planning, load testing, barriers	Y	2	2	3	3	36								
Transportation of small equipment in lab vehicles	Being struck by an object due to improperly secured material or loss of control	Training, lab vehicles rated for load, procedures, loads secured in trucks, work planning, chemicals and radioactive materials in proper containers and labeled, vehicle maintenance , speed limits, traffic rules, snow removal, vehicle inspections	Y	2	3	2	3	36								
Transportation of small equipment in lab vehicles	Transportation accidents, personnel injury	Training, lab vehicles rated for load, procedures, loads secured in trucks, work planning, chemicals and radioactive materials in proper containers and labeled, vehicle maintenance , speed limits, traffic rules, snow removal, vehicle inspections	Y	2	3	3	2	36								
Conduct cleanup	Overexertion – injuries caused by excessive lifting, pushing, pulling, holding, carrying or throwing of an object	Work planning, back safety training as appropriate, dollies, hand trucks	Y	2	3	2	3	36	The OHSAS 18001 management system is expected to raise awareness with regards to sprains and strains during manual-lift or manual-pull work. Strains and sprains and first aid events are discussed at the quarterly WOSH Committee meetings. Each C-AD meeting now starts with “5-minutes” on safety and strain and sprain events are discussed.	Y	2	3	2	2	24	25%
Conduct cleanup	Falls on same level	Work planning, proper shoes, snow removal, work surface maintenance, roof maintenance, postings	Y	2	3	3	2	36	C-A staff was asked to identify outside walking/working surfaces that are in need of repair. PE instituted a program to correct deficiencies. Snow shovels and salt were distributed to staff for emergency use on walkways in winter storms. A safety checklist: Walking and Working Surfaces was distributed to staff. C-A O.P.M. 2.28.d was updated to indicate that work performed with risk factors of slipping and falling shall be classified at a minimum as a moderate hazard job and will require additional review and an Enhance Work Permit.	Y	2	2	3	2	24	25%

Conduct cleanup	Bodily reaction – injuries resulting from bending, climbing, loss of balance and slipping without falling	Work planning, back safety training as appropriate, dollies, hand trucks, snow removal	Y	2	3	2	3	36								
Conduct cleanup	Falls to lower level, such as falling from a ladder or over a railing	Postings, railings, work planning, ladder training	Y	2	3	3	3	54								
Conduct cleanup	Being struck by an object, such as a tool falling on a worker from above	PPE, work planning, postings	Y	2	3	3	2	36								
Conduct cleanup	Being struck against an object, such as a carpenter walking into a door frame	PPE, work planning	Y	2	3	2	2	24								
Conduct cleanup	Becoming caught in or compressed by equipment	Guarding, work planning, postings	Y	2	3	4	2	48								
Conduct cleanup	Contact with temperature – extremes that result in such injuries as heat exhaustion, frost bite or burns	Guarding, postings, work planning	Y	2	3	3	2	36								
Working on Electrical Equipment & Power Supplies BNL Class A & B <250 VAC; <1000Vdc	Shock or electrocution	All equipment is listed or reviewed by CEE; Tier 1 inspections; disconnected cable policy; installations comply with applicable codes; procedures; training; distribution drawings; LOTO; Kirk keys; working hot permits; qualified electricians and technicians; cabinet interlocks; postings; locked areas; guarding; work planning; GFCI; grounding standards; emergency procedures	Y	2	3	4	2	48	A new computer based LOTO program was introduced to better track LOTOs. C-AD supervisors removed temporarily stored items away from disconnects and breaker panels. Technicians, engineers and electricians were trained regarding the proper use of temporary wiring. Temporary wiring installations are now tracked and when due they are removed or converted to permanent wiring. OPM 13.6.2 was modified to state that an ECN is required prior to issuing a work order for all work on the power distribution system. A drawing or a sketch and a printed label or panel directory is now issued with the work order. Supervisors now indicate that all labeling was completed. Electricians have been assigned to label existing disconnects for a few hours each week.	Y	2	3	4	2	48	The likelihood of an injury has been reduced but it is not zero. Severity, frequency and # of people do not change.

Working with Electrical Equipment & Power Supplies BNL Class C <600 VAC; <6000 VDC	Arc blast; burn	Procedures, training, PPE	Y	2	2	5	2	40	“							“
Operating Electrical Disconnects And Switches	Arc blast; burn	Procedures, training, PPE	Y	1	3	4	3	36	“							“
Operating Electrical Disconnects And Switches	Shock or electrocution	All equipment is listed or reviewed by CEE; Tier 1 inspections; disconnected cable policy; installations comply with applicable codes; procedures; training; distribution drawings; LOTO; Kirk keys; working hot permits; qualified electricians and technicians; cabinet interlocks; postings; locked areas; guarding; work planning; GFCI; grounding standards; emergency procedures; two-person rule for hot work	Y	1	3	4	3	36	“							“
Operating Motor Control Centers; Panels And Wall Sockets	Shock or electrocution	All equipment is listed or reviewed by CEE; Tier 1 inspections; disconnected cable policy; installations comply with applicable codes; procedures; training; distribution drawings; LOTO; Kirk keys; working hot permits; ASSRC/ESRC reviews; qualified electricians and technicians; cabinet interlocks; postings; locked areas; guarding; work planning; grounding standards	Y	1	3	4	3	36	“							“
Operating Motor Control Centers; Panels And Wall Sockets	Arc blast; burn	PPE; training; procedures	Y	1	3	4	3	36	A new computer based LOTO program was introduced to better track LOTOs. C-AD supervisors removed temporarily stored items away from disconnects and breaker panels. Technicians, engineers and electricians were trained regarding the proper use of temporary wiring. Temporary wiring installations are now tracked and when due they are removed or converted to permanent wiring. OPM 13.6.2 was modified to state that an ECN is required prior to issuing a work order for all work on the power distribution system. A drawing or a sketch and a printed label or panel directory is now issued with the work order. Supervisors now indicate that all labeling was completed. Electricians have been assigned to label existing disconnects for a few hours each week.	Y	1	3	4	2	24	25%

Using Electrical Powered Hand Tools	Shock or electrocution	All equipment is listed or reviewed by CEE; Tier 1 inspections; procedures; training; labeling; work planning; GFCI; grounding standards; double insulation	Y	2	3	3	2	36	“							The likelihood of an injury has been reduced but it is not zero. Severity, frequency and # of people do not change.
Using Extension Chords; Temporary Wiring And Power Strips	Shock or electrocution	All equipment is listed or reviewed by CEE; Tier 1 inspections; disconnected cable policy; installations comply with applicable codes; procedures; training; distribution drawings; qualified electricians and technicians; GFCI; grounding standards	Y	2	3	3	2	36	“							“
Chemical Handling, spills	Eye exposure	Procedures; compliance with regulations; training; CMS inventory; MSDS; volume controls; PPE as required; locked or controlled areas; postings; labeling; proper containers; segregation; proper spill cleanup equipment available; Tier 1 inspections	Y	2	2	2	3	24								
Chemical Handling, spills	Inhalation exposure	Procedures; compliance with regulations; training; CMS inventory; MSDS; volume controls; PPE as required; locked or controlled areas; postings; labeling; proper containers; segregation; proper spill cleanup equipment available; Tier 1 inspections	Y	2	2	2	3	24								
Chemicals, spills	Fire; explosions	Procedures; compliance with regulations; training; CMS inventory; MSDS; volume controls; PPE as required; locked or controlled areas; postings; labeling; proper containers; segregation; proper spill cleanup equipment available; Tier 1 inspections	Y	2	2	2	3	24	A Fire Protection Engineer has been added to BNL staff and he has begun formal Fire Hazards Analyses for C-AD facilities.	Y	2	2	2	2	16	33%
Chemical Handling, spills	Burns	Procedures, compliance with regulations, training, CMS inventory, MSDS, volume controls, Fire/Rescue group response, PPE as required, locked or controlled areas, postings, labeling, proper containers, segregation, spill cleanup equipment available, Tier 1 inspections	Y	2	2	2	3	24								
Working near vacuum equipment	Being struck against an object due to a pressure differential near a broken vacuum window	Training, posting, guarding, PPE as needed	Y	2	2	4	3	48								

Changing PCB capacitors	Chemical exposure	PPE, postings, PCB capacitor inventory, Fire/rescue spill response, secondary containment, procedures	Y	1	2	2	2	8								
Working with pressurized water and gas systems	Being struck by an object due to a pressure release	LOTO, procedures	Y	2	3	3	2	36								
Working with pressurized water and gas systems	Becoming caught in or compressed by equipment or rotating machinery	LOTO, work planning, procedures, guarding	Y	2	2	4	2	32								
Office work, computer usage	Repetitive motion	Ergonomic work station reviews, rest periods	Y	2	5	2	3	60	C-AD is beginning to spend more time getting workstations reviewed by SHSD. This review effort is limited to the SME.	Y	2	5	2	3	60	No change at this time. Review program is just underway.
Manual Material Handling	Overexertion – injuries caused by excessive lifting, pushing, pulling, holding, carrying or throwing of an object	Gloves; hardhat; handcarts; dollies; training; safety shoes	Y	2	3	2	3	36	The OHSAS 18001 management system is expected to raise awareness with regards to sprains and strains during manual-lift or manual-pull work. Strains and sprains and first aid events are discussed at the quarterly WOSH Committee meetings. Each C-AD meeting now starts with “5-minutes” on safety and strain and sprain events are discussed.	Y	2	3	2	2	24	25%
Entering confined Spaces	Entrapment, engulfment, exposure to dangerous atmospheres.	Barriers, postings, training, atmosphere testing, ventilation as required, confined spaces permits, work planning, procedures, Tier 1 inspections	Y	2	1	4	2	16								
Working with and operating cryogenic systems	Contact with temperature – extremes that result in such injuries as frost bite or burns	Guarding, postings, work planning, procedures	Y	2	4	2	3	48								
Conducting pressure testing with gas	Being struck by an object due to a pressure release	LOTO, relief valve testing, procedures, training, work planning	Y	2	2	3	2	24								
Fork truck use	Being struck by an object due to improperly secured material or loss of control	Weights and center of gravity known, items strapped to mast, daily inspection of fork truck, training, PE maintenance and inspections, PPE	Y	2	3	3	2	36								

Fork truck use	Highway accidents	Training, communications (radios etc.), procedures, emergency response, PPE, work rules, back training, PE maintenance of walking surfaces, street and building lighting, daily inspections, PE maintenance and inspections, items strapped to mast	Y	2	3	4	2	48								
Fork truck use	Being struck against an object, such as a carpenter walking into a door frame	Training, communications (radios etc.), procedures, emergency response, PPE, work rules, back training, PE maintenance of walking surfaces, street and building lighting, daily inspections, PE maintenance and inspections, items strapped to mast	Y	2	2	4	2	48								
Source replacement work at Linac and Tandem	Ionizing radiation exposure	Training, experts prepare sources, MSDS, CMS, procedures, RWP, RCT support if required, two people for work, fume hoods, emergency response, PPE, work planning.	Y	2	2	1	2	8								
Source replacement work at Linac and Tandem - electrical, mechanical	Shock, Becoming caught in or compressed by equipment	Procedures, LOTO, disconnects, proper grounding procedures and equipment, two man rule, expert help	Y	2	2	4	3	48								
Further Description of Controls Added to Reduce Risk:																
*Risk:	0 to 20	21 to 40			41-60				61 to 80				81 or greater			
	Negligible	Acceptable			Moderate				Substantial				Intolerable			